

HAER
CAL
19-AZUSA, V,
1A-

HISTORIC AMERICAN ENGINEERING RECORD

INDEX TO PHOTOGRAPHS

Variable Angle Launcher Complex,
Variable Angle Launcher (Bldg. No. 42115)
California State Highway 39 at the Morris Reservoir
Morris Dam Test Facility
Angeles National Forest
Azusa Vicinity
Los Angeles County
California

HAER No. CA-169-A

HAER PHOTOGRAPHS

Jerry Mosely, Photographer

November 1995

HAER No. CA-169-A-1 THROUGH CA-169-A-85 ARE 8"X10" ENLARGMENTS FROM 4"X5" NEGATIVES.

- CA-169-A-1: VARIABLE-ANGLE LAUNCHER (VAL) CONCRETE "A" FRAME STRUCTURE SHOWING CAMERA TOWER STRUCTURE LOOKING SOUTH AND ARCHED OPENING FOR ROADWAY .
- CA-169-A-2: VAL CONCRETE "A" FRAME STRUCTURE SHOWING CAMERA TOWER, PROJECTILE LOADING DECK AND BREECH END OF LAUNCHER BRIDGE LOOKING SOUTH.
- CA-169-A-3: VAL PROJECTILE LOADING DECK, SUPPORT CARRIAGE AND LAUNCHING BRIDGE LOOKING SOUTHWEST.
- CA-169-A-4: VAL PARTIAL ELEVATION SHOWING LAUNCHER BRIDGE ON SUPPORTS, LAUNCHER SLAB, SUPPORT CARRIAGE, CONCRETE "A" FRAME STRUCTURE AND CAMERA TOWER LOOKING SOUTHEAST.
- CA-169-A-5: VAL LAUNCHER BRIDGE OVER LAUNCHER SLAB TAKEN FROM RESERVOIR LOOKING NORTH.
- CA-169-A-6: VAL LAUNCHER BRIDGE, CARRIAGE SUPPORT, CONCRETE "A" FRAME STRUCTURE AND CAMERA TOWER LOOKING NORTHWEST.
- CA-169-A-7: VAL CONCRETE "A" FRAME STRUCTURE SHOWING CAMERA TOWER ARCHED OPENING FOR ROADWAY AND COUNTERWEIGHT SLOPE TAKEN FROM RESERVOIR LOOKING WEST.

Variable Angle Launcher Complex,
Variable Angle Launcher (Bldg. No. 42115)
HAER No. CA-169-A (Page No. 2)
Index to Photographs

- CA-169-A-8: VAL COUNTERWEIGHT CAR ON COUNTERWEIGHT SLAB AND CAMERA TOWER TAKEN FROM RESERVOIR LOOKING SOUTHWEST.
- CA-169-A-9: VAL, DETAIL OF ARCHED OPENING FOR ROADWAY LOOKING SOUTH.
- CA-169-A-10: VAL, DETAIL OF CAMERA TOWER LOOKING NORTHEAST.
- CA-169-A-11: VAL, DETAIL OF CAMERA TOWER AND THE TOP OF CONCRETE "A" FRAME STRUCTURE LOOKING NORTH.
- CA-169-A-12: VAL, DETAIL OF CAMERA TOWER LOOKING SOUTHWEST.
- CA-169-A-13: VAL, DETAIL OF CAMERA TOWER LOOKING SOUTH.
- CA-169-A-14: VAL, DETAIL OF CAMERA TOWER LOOKING SOUTHEAST.
- CA-169-A-15: VAL, DETAIL OF SUPPORT CARRIAGE, PROJECTILE LOADING DECK AND THE BREECH END OF THE LAUNCHER BRIDGE LOOKING NORTHWEST.
- CA-169-A-16: VAL PROJECTILE LOADING DECK AND VIEW OF RESERVOIR LOOKING SOUTHWEST WITH MORRIS DAM IN THE DISTANCE.
- CA-169-A-17: VAL PROJECTILE LOADING DECK AND BREECH END OF LAUNCHER BRIDGE LOOKING SOUTH.
- CA-169-A-18: VAL, DETAIL OF LAUNCHER BRIDGE ALONG THE SIDE OF THE 32" DIAMETER LAUNCHING TUBE LOOKING SOUTHWEST.
- CA-169-A-19: VAL, DETAIL OF "Y" JOINT CONNECTING THE COMPRESSION TANK TO THE LAUNCHING TUBES.
- CA-169-A-20: VAL, DETAIL OF QUICK-ACTING VALVE (QAV) ABOVE COMPRESSION TANK ON THE LAUNCHER BRIDGE.
- CA-169-A-21: VAL, DETAIL OF MUZZLE END OF LAUNCHER BRIDGE SHOWING BOTH LAUNCHER TUBES TAKEN FROM RESERVOIR LOOKING NORTH.
- CA-169-A-22: VAL, VIEW OF PROJECTILE LOADING DECK LOOKING NORTHEAST TOWARD TOP OF CONCRETE "A" FRAME STRUCTURE SHOWING DRIVE CABLES, DRIVE GEAR, BOTTOM OF CAMERA TOWER AND "CROWS NEST" CONTROL ROOM.
- CA-169-A-23: VAL, DETAIL OF DRIVE GEAR AND CABLES LOOKING NORTH.

Variable Angle Launcher Complex,
Variable Angle Launcher (Bldg. No. 42115)
HAER No. CA-169-A (Page No. 3)
Index to Photographs

- CA-169-A-24: VAL, CONTROL PANELS FOR LAUNCHER BRIDGE COUNTERWEIGHT CAR AND WINDSTAY WINCHES OVERLOOKING FIRING RANGE AND MORRIS DAM LOOKING SOUTHWEST.
- CA-169-A-25: VAL, DETAIL OF CONTROL PANEL FOR LAUNCHER BRIDGE, COUNTERWEIGHT CAR AND WINDSTAY WINCHES.
- CA-169-A-26: VAL, DETAIL OF CONTROL PANEL FOR LAUNCHER BRIDGE, COUNTERWEIGHT CAR AND WINDSTAY WINCHES.
- CA-169-A-27: VAL, DETAIL OF LAUNCHER SLAB AND LAUNCHER RAIL WITH 7 INCH DIAMETER HOLE FOR SUPPORT CARRIAGE LOCKING PIN.
- CA-169-A-28: VAL, DETAIL OF SUPPORT CARRIAGE WHEEL ASSEMBLY ON LAUNCHER RAIL.
- CA-169-A-29: VAL, DETAIL OF THE TOP OF CONCRETE "A" FRAME STRUCTURE LOOKING SOUTH SHOWING CANTILEVERED WALKWAYS, DRIVE GEAR AND PROJECTILE LOADING CAR.
- CA-169-A-30: VAL LOOKING DOWN THE LAUNCHER SLAB STAIRS AT THE PROJECTILE LOADING CAR AND LOADING PLATFORM ADJACENT TO THE PROJECTILE LOADING DECK AND LAUNCHER BRIDGE.
- CA-169-A-31: VAL, DETAIL OF LOADING PLATFORM ADJACENT TO LAUNCHER BRIDGE LOOKING WEST.
- CA-169-A-32: VAL, DETAIL SHOWING LOADING PLATFORM, PROJECTILE LOADING CAR, LAUNCHER SLAB AND UNDERSIDE OF LAUNCHER BRIDGE LOOKING SOUTHWEST.
- CA-169-A-33: VAL, DETAIL OF PERSONNEL CAR AT THE TOP OF THE COUNTERWEIGHT SLAB WITH THE COUNTERWEIGHT CAR IN DISTANCE LOOKING NORTH.
- CA-169-A-34: VAL, DETAIL OF STAIRS ON COUNTERWEIGHT SLAB WITH COUNTERWEIGHT CAR RAILS ON RIGHT AND PERSONNEL CAR RAILS ON LEFT.
- CA-169-A-35: VAL, DETAIL OF COUNTERWEIGHT CAR AND CONNECTING CABLES LOOKING NORTH.
- CA-169-A-36: VAL, DETAIL OF TYPICAL INTERIOR OF CONCRETE "A" FRAME STRUCTURE SHOWING PAINTED CONCRETE WALLS, CONCRETE STAIRS AND INTERIOR WOOD DOOR.

Variable Angle Launcher Complex,
Variable Angle Launcher (Bldg. No. 42115)
HAER No. CA-169-A (Page No. 4)
Index to Photographs

- CA-169-A-37: VAL SECONDARY CONTROL ROOM INSIDE CONCRETE "A" FRAME STRUCTURE.
- CA-169-A-38: VAL, DETAIL OF PANEL AT SECONDARY CONTROL ROOM INSIDE CONCRETE "A" FRAME STRUCTURE.
- CA-169-A-39: VAL, DETAIL OF INTERIOR ROOM OF CONCRETE "A" FRAME STRUCTURE SHOWING NATURAL ROCK PROTRUDING THROUGH SLAB AT STORAGE ROOM.
- CA-169-A-40: VAL CONNECTING BRIDGE AND BARGES FLOATING ON RESERVOIR (PREVIOUSLY SUPPORTED MUZZLE END OF LAUNCHER BRIDGE).
- CA-169-A-41: VAL, DETAIL OF CONNECTING BRIDGE SHOWING SIDE THAT FACED THE FIRING RANGE TAKEN FROM THE BARGE DECK.
- CA-169-A-42: VAL, DETAIL OF CONNECTING BRIDGE SHOWING SIDE THAT FACED THE VAL TAKEN FROM BARGE DECK.
- CA-169-A-43: VAL, DETAIL OF CAMERA STATION ON CONNECTING BRIDGE SHOWING SIDE THAT FACED THE VAL.
- CA-169-A-44: VAL, DETAIL LOOKING THROUGH THE CONNECTING BRIDGE FROM BARGE TO BARGE.
- CA-169-A-45: VAL, DETAIL OF FLOATING BARGE TAKEN FROM RESERVOIR.
- CA-169-A-46: VAL, DETAIL OF "PILLOW BLOCK" WHERE LAUNCHER BRIDGE PIN SAT AT THE TOP OF THE CONNECTING BRIDGE.
- CA-169-A-47: VAL, DETAIL OF WELDED "I" BEAM CONNECTION ON CONNECTING BRIDGE.
- NOTE: Photographs no. CA-169-A-48 through CA-169-A-85 are photographic copies of photographs. Original photographs in possession of United States Navy, Naval Research And Development, Photography - Multimedia Branch, San Diego, California 92152-5000 (except as noted).
- CA-169-A-48: VIEW ACROSS RESERVOIR OF SLOPE PREPARATION FOR VARIABLE-ANGLE LAUNCHER (VAL) SLAB LOOKING NORTHEAST, November 6, 1946.
- CA-169-A-49: DETAIL VIEW OF SLOPE PREPARATION FOR VARIABLE-ANGLE LAUNCHER SLAB LOOKING NORTH, November 6, 1946.
- CA-169-A-50: VIEW FROM STATE HIGHWAY 39 LOOKING SOUTHWEST AT THE PARTIALLY COMPLETED VAL COUNTERWEIGHT SLAB AND SECOND STORY ADDITION TO THE ADMINISTRATION BUILDING. November 21, 1946.

Variable Angle Launcher Complex,
Variable Angle Launcher (Bldg. No. 42115)
HAER No. CA-169-A (Page No. 5)
Index to Photographs

- CA-169-A-51: CONCRETE FORMWORK FOR THE VAL CELLULAR "A" FRAME STRUCTURE LOOKING NORTHWEST, Date unknown, circa December 1946.
- CA-169-A-52: CONCRETE FORMWORK FOR THE VAL CELLULAR "A" FRAME STRUCTURE LOOKING SOUTH, Date unknown, circa December 1946.
- CA-169-A-53: VAL CONCRETE "A" FRAME STRUCTURE AFTER FORMWORK REMOVED, Date unknown, circa December 1946.
- CA-169-A-54: VAL COUNTERWEIGHT CAR DURING CONSTRUCTION SHOWING CAR FRAME, WHEEL ASSEMBLIES AND METAL REINFORCING, December 19, 1947. (Original photograph in possession of Dave Willis, San Diego, California.)
- CA-169-A-55: VIEW OF FINISHED CONCRETE COUNTERWEIGHT CAR SUPPORTED BY BLOCK AND TACKLE ASSEMBLY LOOKING WEST, Date unknown, circa January 1948.
- CA-169-A-56: ASSEMBLY OF THE VAL BRIDGE STRUCTURE AT ISLIP CANYON, July 31, 1947. (Original photograph in possession of Dave Willis, San Diego, California.)
- CA-169-A-57: INTERIOR VIEW OF VAL BRIDGE STRUCTURE SHOWING LAUNCHING TUBE, STAIRS AND PORTION OF LAUNCHING DECK. NOTE SUPPORT CARRIAGE ASSEMBLY IN DISTANCE. Date unknown, circa March 1948. (Original photograph in possession of Dave Willis, San Diego, California.)
- CA-169-A-58: AIR PRESSURIZATION TANK BEING LIFTED INTO PLACE ON THE VAL BRIDGE STRUCTURE AT ISLIP CANYON, April 9, 1948.
- CA-169-A-59: DETAIL OF AIR PRESSURIZATION TANK INSTALLATION, April 9, 1948.
- CA-169-A-60: SUPPORT CARRIAGE ASSEMBLY AT ISLIP CANYON SHOWING CURVED RAILS AND FLOATING BARGE IN BACKGROUND, February 16, 1948.
- CA-169-A-61: SIDE VIEW OF SUPPORT CARRIAGE ASSEMBLY WITH VAL BRIDGE STRUCTURE IN BACKGROUND AT ISLIP CANYON, Date unknown, circa February 1948. (Original photograph in possession of Dave Willis, San Diego, California.)
- CA-169-A-62: SUPPORT CARRIAGE ASSEMBLY AT BASE OF VAL LAUNCHING SLAB AFTER TRANSFER FROM BARGE IN FOREGROUND, February, 11, 1948. (Original photograph in possession of Dave Willis, San Diego, California.)

Variable Angle Launcher Complex,
Variable Angle Launcher (Bldg. No. 42115)
HAER No. CA-169-A (Page No. 6)
Index to Photographs

- CA-169-A-63: VIEW LOOKING DOWN VAL LAUNCHING SLAB SHOWING DRIVE GEARS, CABLES, LAUNCHER RAILS, PROJECTILE CAR AND SUPPORT CARRIAGE, April 8, 1948. (Original photograph in possession of Dave Willis, San Diego, California.)
- CA-169-A-64: DETAIL OF CONNECTIONS FOR SIXTEEN CABLES AT THE CARRIAGE SUPPORT STRUCTURE, April 20, 1948.
- CA-169-A-65: AERIAL VIEW OF VAL BRIDGE AND BARGES AT ISLIP CANYON, December 9, 1947. (Original photograph in possession of Dave Willis, San Diego, California.)
- CA-169-A-66: VAL BRIDGE AND BARGES FLOATING FROM ISLIP CANYON TO THE VAL SITE, April 12, 1948. (Original photograph in possession of Dave Willis, San Diego, California.)
- CA-169-A-67: VAL BRIDGE AND BARGES PRIOR TO CONNECTING TO SUPPORT CARRIAGE, April 12, 1948.
- CA-169-A-68: COMPLETED ASSEMBLY SHOWING BARGES, BRIDGE AND SUPPORT CARRIAGE AT THE BASE OF THE LAUNCHING SLAB LOOKING EAST, April 26, 1948.
- CA-169-A-69: COMPLETED "A" FRAME STRUCTURE LOOKING NORTHWEST SHOWING CANTILEVERED WALKWAYS, "CROWSNEST", CAMERA TOWER, COUNTERWEIGHT CAR AND ROADWAY ARCH, April 30, 1948. (Original photograph in possession of Dave Willis, San Diego, California.)
- CA-169-A-70: VIEW OF VAL STRUCTURE LOOKING SOUTHWEST SHOWING COUNTERWEIGHT CAR, COUNTERWEIGHT SLAB, "A" FRAME STRUCTURE, CAMERA TOWER AND ROADWAY ARCH, July 28, 1948.
- CA-169-A-71: COMPLETED "A" FRAME STRUCTURE LOOKING SOUTH SHOWING CAMERA TOWER, DRIVE GEARS, COUNTERWEIGHT CAR AND CANTILEVERED WALKWAYS, July 28, 1948. (Original photograph in possession of Dave Willis, San Diego, California.)
- CA-169-A-72: DETAIL OF VAL SUPPORT CARRIAGE AND BREECH END OF LAUNCHER BRIDGE LOOKING SOUTH, July 28, 1948.
- CA-169-A-73: DETAIL OF "A" FRAME STRUCTURE LOOKING NORTH SHOWING PROJECTILE CAR, CAMERA TOWER, CANTILEVERED WALKWAYS AND ELECTRICAL GEAR, August 17, 1948. (Original photograph in possession of Dave Willis, San Diego, California.)

Variable Angle Launcher Complex,
Variable Angle Launcher (Bldg. No. 42115)
HAER No. CA-169-A (Page No. 7)
Index to Photographs

- CA-169-A-74: DETAIL VIEW OF INSIDE THE LAUNCHING BRIDGE LOOKING SOUTHWEST SHOWING ADJUSTABLE STAIRS ON THE LEFT AND LAUNCHING TUBE ON THE RIGHT, Date unknown, circa 1948.
- CA-169-A-75: FIRST TEST SHOT OF THE VAL AT THE DEDICATION CEREMONIES AS SEEN FROM A FIXED CAMERA STATION, May 7, 1948. (Original photograph in possession of Dave Willis, San Diego, California.)
- CA-169-A-76: FIRST TEST SHOT OF THE VAL AT THE DEDICATION CEREMONIES AS SEEN FROM THE OBSERVATION DECK ABOVE THE CONTROL STATION, May 7, 1948.
- CA-169-A-77: DETAIL OF A WOODEN SABOT USED TO FIRE SMALL DIAMETER TORPEDOES IN A LARGER DIAMETER LAUNCHING TUBE, Date unknown, circa 1949. (Original photograph in possession of Dave Willis, San Diego, California.)
- CA-169-A-78: PHOTO OF A PROJECTILE FIRING USING A SABOT TAKEN WITH A 70 MM MITCHEL MOTION PICTURE CAMERA, Date unknown, circa 1950. (Original photograph in possession of Dave Willis, San Diego, California.) Photograph represents central frame of negative.
- CA-169-A-79: VIEW OF VAL FIRING RANGE LOOKING SOUTHWEST SHOWING LAUNCHER BRIDGE, BARGES, SONAR BUOY RANGE AND MORRIS DAM IN BACKGROUND, June 10, 1948.
- CA-169-A-80: VIEW OF VAL SET FOR LOW ANGLE SHOT WITH LAUNCHER BRIDGE TURNED TO THE LEFT FOR A LAND BACKDROP IN CASE OF PROJECTILE RICHOCET, June 1, 1948.
- CA-169-A-81: VIEW OF VAL LOOKING NORTH AS SEEN FROM THE RESERVOIR SHOWING TWO LAUNCHING TUBES ON THE LAUNCHER BRIDGE, Date unknown, circa 1952. (Original photograph in possession of Dave Willis, San Diego, California.)
- CA-169-A-82: DETAIL OF THE MUZZLE END OF THE LAUNCHER BRIDGE LOOKING NORTH SHOWING THE CONNECTING BRIDGE AND TWO LAUNCHING TUBES, Date unknown, circa 1952. (Original photograph in possession of Dave Willis, San Diego, California.)
- CA-169-A-83: DETAIL OF THE MUZZLE END OF THE LAUNCHER BRIDGE ON TEMPORARY SUPPORTS LOOKING NORTHEAST SHOWING TWO LAUNCHING TUBES, Date unknown, circa 1950'S. (Original photograph in possession of Dave Willis, San Diego, California.)

Variable Angle Launcher Complex,
Variable Angle Launcher (Bldg. No. 42115)
HAER No. CA-169-A (Page No. 8)
Index to Photographs

CA-169-A-84: VIEW FROM CAMERA TOWER LOOKING SOUTHWEST SHOWING VAL FIRING RANGE WITH OVERHEAD CAMERA AND CABLES, Date unknown, circa 1949.

CA-169-A-85: VIEW FROM THE RESERVOIR LOOKING SOUTHWEST AT THE MUZZLE END OF THE FIXED ANGLE LAUNCHER, June 7, 1948. (Original photograph in possession of Dave Willis, San Diego, California.)

NOTE: Photographs no. CA-169-A-86 through CA-169-A-101 are photographic copies of drawings. Original drawings in possession of United States Navy, Naval Research and Development, "Archive Room", San Diego, California 92152-5000.

CA-169-A-86: 22"X34" original vellum, Variable-Angle Launcher "GENERAL PLAN AND ELEVATION" drawn at 1"=40'. (BUORD Sketch # 207184, PAPW 1892).

CA-169-A-87: 22"X34" original vellum, Variable-Angle Launcher "WEST ELEVATION AND PLAN - MAIN STRUCTURE" drawn at 1"=10'. (BUORD Sketch # 207648, PAPW 1832).

CA-169-A-88: 22"X34" original vellum, Variable-Angle Launcher "EAST ELEVATION AND PLAN MAIN STRUCTURE" drawn at 1"=10'. (BUORD Sketch # 207572, PAPW 1833)

CA-169-A-89: 22"X34" original vellum, Variable-Angle Launcher "ELEVATION OF LAUNCHER BRIDGE ON TEMPORARY SUPPORT" drawn at 1"=20'. (BUORD Sketch #209786, PAPW 1932).

CA-169-A-90: 22"X34" original blueprint, Variable-Angle Launcher, "FRONT ELEVATION OF LAUNCHER BRIDGE, CONNECTING BRIDGE AND BARGES" drawn at 1/4"=1'0". (BUORD Sketch # 208247).

CA-169-A-91: 22"X34" original blueprint, Variable-Angle Launcher, "CONNECTING BRIDGE, REAR VIEW CAMERA HOUSE ASSEMBLY" drawn at 3/8"=1'-0", 3"=1'-0". (BUORD Sketch # 209042).

CA-169-A-92: 22"X34" original blueprint, Variable-Angle Launcher, "CAMERA CABLE TOWER PLAN AND ELEVATION" drawn at 3/8"=1'-0" (BUORD Sketch # 208580).

CA-169-A-93: 22"X34" original blueprint, Variable-Angle Launcher, "OVERHEAD CAMERA SUSPENSION SYSTEM, TOWER STAY CABLES" drawn at 1/4"=1'-0". (BUORD Sketch # 208783).

CA-169-A-94: 22"X34" original blueprint, Variable-Angle Launcher, "MAIN RAIL" drawn at 1"=1'-0". (BUORD Sketch # 207406).

Variable Angle Launcher Complex,
Variable Angle Launcher (Bldg. No. 42115)
HAER No. CA-169-A (Page No. 9)
Index to Photographs

- CA-169-A-95: 28"X40" original vellum, Variable-Angle Launcher "32 INCH TUBE ASSEMBLY" drawn at $\frac{1}{8}"=1'-0"$, $1"=1'-0"$ and $1"=40'$. (P.W. DWG. NO. 1782).
- CA-169-A-96: 28"X40" original vellum, Variable-Angle Launcher "32 INCH TUBE ASSEMBLY SECTION 1" drawn at $3"=1'-0"$, $6"=1'-0"$, and full size. (P.W. DWG. NO. 1783).
- CA-169-A-97: 28"X40" original vellum, Variable-Angle Launcher "32 INCH UPPER TUBE ASSEMBLY" drawn at $2"=1'-0"$ and $6"=1'-0"$, full size. (P.W. DWG. NO. 1784).
- CA-169-A-98: 28"X40" original vellum, Variable-Angle Launcher "32 INCH "Y" JOINT AND TRANSITION ASSEMBLY" drawn at $1\frac{1}{2}"=1'-0"$. (P.W. DWG. NO. 1785).
- CA-169-A-99: 28"X40" original vellum, Variable-Angle Launcher "32 INCH "Y" JOINT DETAILS drawn at $1\frac{1}{2}"=1'-0"$ and $6"=1'-0"$. (P.W. DWG. NO. 1786).
- CA-169-A-100: 28"X40" original vellum, Variable-Angle Launcher "32 INCH BREECH" drawn at $2"=1'-0"$, $3"=1'-0"$ and full size. (P.W. DWG. NO. 1787).
- CA-169-A-101: 28"X40" original vellum, Variable-Angle Launcher "32 INCH BREECH DOOR OPERATING MECHANISM ASSEMBLY" drawn at $3"=1'-0"$, $6"=1'-0"$, and full size. (P.W. DRW. NO. 1788).